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10/643,061	08/18/2003	Mark F. Mathias	8540G-000091	4150

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EXAMINER	
CHU, HELEN OK	

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BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MARK F. MATHIAS,
JORG ROTH, and MICHAEL K. BUDINSKI,
Appellants

Appeal 2008-3573
Application 10/643,061[1]
Technology Center 1700

Decided: June 30, 2008

Before CAROL A. SPIEGEL, LINDA M. GAUDETTE, and
MARK NAGUMO, *Administrative Patent Judges*.

NAGUMO, *Administrative Patent Judge*.

DECISION ON APPEAL

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[1] Application filed 18 August 2003, titled *Diffusion Media for Use in a PEM Fuel Cell*. The real party in interest is listed as GM Corp. (Appeal Brief filed 23 July 2007 ("Br."), at 1.)

Mark F. Mathias, Jorg Roth, and Michael K. Budinski ("Mathias") appeal from the final rejection of claims 1-10[2] under 35 U.S.C. § 102(b) in view of Denton.[3, 4] We REVERSE.

The claimed subject matter relates to "proton-exchange membrane ("PEM") fuel cells having a permeable diffusion media that is rigid along a transverse axis, flexible along a lateral axis, and that is of substantially incompressible thickness. As a result of these mechanical properties, the diffusion media is said to be rollable in the machine direction and to provide desirable mechanical properties to the finished PEM fuel cells.

Claim 1, which is representative of the issues necessary to resolve this appeal, reads:

Claim 1

A PEM fuel cell comprising:
an electrode plate having a flow field formed therein; and
a membrane-electrode assembly including
permeable diffusion media disposed adjacent said electrode plate,
said permeable diffusion media being rigid along a transverse axis, flexible along a lateral axis and having a substantially incompressible thickness,
wherein said transverse axis crosses first channels of said flow field,
said first channels defining a predominate flow direction.

[2] The remainder of the pending claims, claims 11-25, stand withdrawn from consideration.

[3] Jan Denton, *et al.*, *Gas Diffusion Electrodes*, U.S. Patent 6,010,606, 4 January 2000 ("Denton").

[4] Examiner's Answer ("Ans.") mailed 18 October 2007, at 3.

(Claims App., Br. at 10; paragraphing and indentation added.)

The Examiner finds that Denton describes a fuel cell meeting all the limitations of claims 1-10. (Ans. 3.) In particular, the Examiner finds that Denton "discloses dimensionally stable (rigid) and highly flexible gas diffusion electrodes" at column 4, lines 33-34. (*Id.*)

Mathias argues that the Examiner errs because Denton describes diffusion media that are flexible regardless of direction. (Br. 5.) Mathias argues that the Examiner errs further in equating the term "rigid," as it appears in the claims, with the term "dimensionally stable," used by Denton. (Br. 7.) Rather, according to Mathias, Denton's dimensional stability refers to stretching resistance. (*Id.*, citing various passages in Denton.) Mathias does not challenge any other aspect of the Examiner's findings of fact.

The Examiner's position is without merit. According to Denton, "[a] major problem with conventional gas diffusion electrodes based on the carbon fibre paper substrates is the lack of flexibility due to the rigid substrate that is typically used." (Denton 2:50-52.) Moreover, conventional gas diffusion electrodes based on woven cloth substrates are said to "lack good dimensional stability, as the cloth can easily be stretched in the directions of the major planar faces." (*Id.* at 58-59.) In Denton's words, "[a] major advantage of the present invention is that a free-standing, dimensionally stable and highly flexible gas diffusion electrode is obtained." (*Id.* at 4:32-34.)

The Examiner has directed our attention to Denton at column 3, lines 40-50 and column 4, lines 33-34 in support of the rejection. (Ans. 3, 8.)

While Denton does refer to the introduction of "anisotropic character" by using longer fibers, "typically ≥ 50 mm," Denton does not refer to stiffness. In the context of Denton's disclosure, particularly Denton's statement in the next column that a major advantage of the disclosed invention is obtaining a "free-standing, dimensionally stable and highly flexible gas diffusion electrode" it cannot be said that Denton describes a permeable diffusion media that is rigid along any axis. Thus, the Examiner's equation of dimensional stability with stiffness and anisotropic properties (Ans. 8-9) is not supported by Denton. Nor has the Examiner directed our attention to any description or definition in the supporting disclosure that supports such a sweeping construction of the claim terminology.

According to the Examiner's reasoning, "[t]hough the claimed recitation requires that the lateral axis has to be flexible and the transverse axis has to be rigid, there are no limitations that [the] lateral axis cannot also be rigid and the transverse axis cannot also be flexible." (Ans. 8) Thus, the Examiner's position is apparently that Denton's medium can be flexed both transversely and laterally without the size and shape of the medium changing, i.e., it is dimensionally stable and therefore rigid. However, a dimensionally stable body is not necessarily a "rigid" body as required because a body that is "rigid along a transverse axis" would not also be flexible along that axis.

In view of the record and the foregoing considerations, it is

ORDERED that the rejection of claims 1-10 under 35 U.S.C. § 102(b) in view of Denton is REVERSED.

REVERSED

qsg

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